

57332

Work Order ID 57322

April 6, 2010 1:19:11 PM



Page 1

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

PL

Date:

10-4-06

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D2904

Rev B

100



DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile & type labels per PPPD315-668-011

CHG 001

SC

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DOA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Page 2

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Revision ID:

Item Name: Skidtube LH

Setup Start

Stop



Start Date: 06/04/2010 Start Qty: 1.00

Required Date: 16/04/2010 Req'd Qty: 1.00



Cust Item ID:

Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev. Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

110



Skidtubes

Skidtubes

Skidtubes

Memo

LANDING GEAR RESOURCE 1

0.00

1-Cut D2904b to length as per dwg D2904

11/10/4/14

2-Drill aft and fwd cap holes as per dwg D2904 using DT8025 jig
(DO NOT OPEN TO FINISH SIZE)3-Drill saddle holes (6 Deg) as per Dwg D2904 using DT8938A jig
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)4-Drill GHW holes (3 Deg) as per Dwg D2904 using DT8938B jig
(ENSURE THAT LOCATOR RING IS SET FOR LH TUBE)5-Insert and cleco doublers and DT8938d in position. Transfer all 256 holes thru
tube and doublers.

6-Remove doublers and identify batch# and orientation

7-C'sink Rivet holes 256 places as per Dwg D2904 and deburr

8-Locate from saddle holes, drill wearplate holes using DT8994. Jig must be 1.7"
from aft end of tube (REF)9-Remove fwd and aft indexing ridges as per dwg D2904. Open fwd and aft cap
holes to finish size, scribe batch# at aft end of tube.

10-Remove marks left from drill jig and deburr

10-4-14

10-4-14

RO

11 10/4/29

10-5-3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: D315-668-011 PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: *raised* Date: 10-06-05

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR: <u>57322</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
10.04.19	110	MS20601AD403 RIVETS ARE BREAKING DURING INSTALLATION	<i>CP</i> 10.04.19 pw OSI 042	USE CR3212 CR3212-4-03 RIVETS. FSHEIR = 24016 FOR MS20601 FSHEIR = 66410 FOR CR3212	<i>M</i> 07/5/12	<i>S</i> 01/05/12	<i>CP</i> 10.04.19 pw OSI 042	<i>S</i> 10/05/12
10.05.20	110	WEARSHOTS HOLES OFF BY 12° RC: Tooling - NCR10-093	<i>[Signature]</i> OSI 042	SCRAP TUBE <i>CP</i> 10.05.20	<i>BE</i> 10/08/03	<i>[Signature]</i> 10-8-3	<i>[Signature]</i> OSI 042	<i>[Signature]</i> 10-06-03

NOTE: Date & initial all entries

Chris Provencal

From: Chris Provencal [cprovencal@dartaero.com]**Sent:** April 19, 2010 1:32 PM**To:** 'David Shepherd'**Cc:** 'Mike Petsche'; 'Bill Beckett'; 'Dan Stow'**Subject:** RE: Lama skidtube deviation

Per SR-D315-668 Rev. B, the shear strength of the MS20601AD4W3 was 240 lb. Per Cherrymax Rivet Data Sheet, the shear of a CR3212 is 664 lb.

According to Dan, this has been an issue for as long as he can remember, it's just that he would normally just replace the broken rivets without making an issue out of it. The stem is breaking inside the rivet instead of flush with the head.

-Chris

From: David Shepherd [mailto:dshepherd@dartaero.com]**Sent:** April 19, 2010 12:03 PM**To:** 'Chris Provencal'**Cc:** 'Mike Petsche'; 'Bill Beckett'; 'Dan Stow'**Subject:** RE: Lama skidtube deviation

As long as you are 100% confident that the rivets are stronger than what you analyzed to, then I am OK with the substitution.

Although we haven't made many Lama skidtubes, this is not the first time we've ever made these parts ... How did we ever make them before? Perhaps we were more skilled 5 years ago?

David

From: Chris Provencal [mailto:cprovencal@dartaero.com]**Sent:** Monday, April 19, 2010 9:47 AM**To:** 'David Shepherd'**Cc:** 'Mike Petsche'**Subject:** Lama skidtube deviation

David,

For D315-668-XXX Lama Skidtubes, they want to use CR3212 rivets instead of the MS20601AD4W3 rivets to attach the doublers. They're having to replace about 35% of the mil spec rivets because they break before being able to pull the doubler against the skidtube. They've started using the cherrymax rivets for a few of the doublers and haven't had to replace a single one.

Bill is OK with using the new rivets, the time saved should make up for the additional cost of the rivet.

Besides the obvious strength difference, the MS rivets are all-aluminum, while the cherrymax are aluminum exterior with an alloy-steel pin. Unless you have an objection, I'll sign off the w/o's (based on stronger rivet and that we've used them on other skids) and update dwgs.

-Chris

No virus found in this incoming message.

Checked by AVG - www.avg.com

Version: 8.5.437 / Virus Database: 271.1.1/2820 - Release Date: 04/19/10 06:31:00

2010-04-19

CHERRYMAX® RIVET SELECTION

MECHANICAL PROPERTIES

Materials		Ultimate Shear Strength	Maximum Temperature
Sleeve	Stem		
5056 Aluminum	Alloy Steel	50,000 PSI	250°F
5056 Aluminum	CRES	50,000 PSI	250°F
Monel	CRES	75,000 PSI	900°F
Inco 600	Inco X-750	75,000 PSI	1400°F

MINIMUM RIVET SHEAR & TENSILE STRENGTH (LBS.) IN STEEL COUPONS

RIVET DIAM.	SHEET THICK.	SINGLE SHEAR					TENSILE						
		ALUMINUM		MONEL		INCO	ALUMINUM			MONEL		INCO	
		Nom.	O/S	Nom.	O/S	O/S	Nom.	O/S		Nom.	O/S	O/S	
		3212	3242	3522	3552	3852	3212	3214	3242	3522	3524	3552	3852
		3213	3243	3523	3553	3853	3213	3224	3243	3523		3553	3853
		3214	3245	3524	3555		3222		3245			3555	
		3222	3246		3556		3223		3246			3556	
		3223	3252						3252				
		3224	3253						3253				
			3255						3255				
1/8 (-4)	2x.156	664	814	995	1220	1220	285	250	345	400	360	490	570
5/32 (-5)	2x.187	1030	1245	1545	1865	1865	445	390	530	635	555	740	860
3/16 (-6)	2x.219	1480	1685	2215	2525	2525	635	560	710	890	800	1000	1160
1/4 (-8)	2x.281	2615	2925	3920	4390	4390	1125	1000	1260	1570	1410	1755	2030

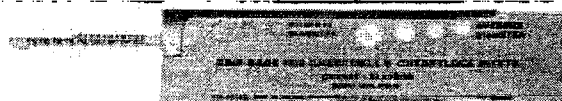
Values shown are fastener capabilities only. Design values will be limited by the bearing strength of the sheet material used.

GAGES

269C3 GRIP GAGE

NATIONAL STOCK NUMBER 5210-00-255-7544

A simple, self-explanatory gage for determining material thickness and proper rivet grip length.



T-172 RIVET HOLE SIZE GAGE

These are precision ground, go no-go gages used to check holes drilled for CherryMAX® rivets. They are made in both nominal and oversize rivet diameters.



RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.	RIVET DIAMETER	GAGE NUMBER	NATIONAL STOCK NO.
1/8" Nominal	T-172-4	5220-00-478-4135	1/8" Oversize	T-172-400	5220-00-478-4137
5/32" Nominal	T-172-5	5220-01-021-3276	5/32" Oversize	T-172-500	5220-00-478-4140
3/16" Nominal	T-172-6	5220-00-478-4136	3/16" Oversize	T-172-600	5220-00-478-4141
1/4" Nominal	T-172-8	5220-00-478-4139	1/4" Oversize	T-172-800	5220-01-374-1340

ATTENTION

Blind rivets are not always a suitable substitute for solid rivets. Maintenance personnel are reminded that AC 43.13-1A chapter 2, section 3 stipulates: "Do not substitute hollow rivets for solid rivets in load carrying members without specific approval of the application by a representative of the Federal Aviation Administration. Blind rivets may be used in blind locations in accordance with the conditions listed in Chapter 5, provided the edge distances and spacings are not less than the minimum listed in paragraph 99d."

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Page 3

Item ID: D315-668-011

Accept



Setup Start



Revision ID:

Item Name: Skidtube LH

Stop



Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev. Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120



QC

Quality Control

QC5- Inspect part completeness to step on W/O

Memo

0.00

0.00

Sublot 03

★ SEE WORKER
~~AT END OF LOT~~

(70)

130



HandFinish

Hand Finishing

Chemical Conversion Coat per QSI005 4.1

Memo

0.00

0.00

1 - - AWP
10-5-4

140



QC

Quality Control

QC3- Inspect Part Finish

Memo

0.00

0.00

1 10/5/6

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DOA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Work Order ID 57322

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Setup Start



Revision ID:

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Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev. Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150



Skidtubes

Skidtubes

0.00

Memo

0.00

Skidtubes

LANDING GEAR RESOURCE 1

1-Remove alodine around X-Bolt holes on doublers

2-Rivet doublers as per Dwg D2904.(DO NOT INSTALL RIVETS AROUND X-BOLT HOLES AT THIS TIME)

3-Open X-Bolt spacer holes to finish size as per dwg D2904.(DO NOT USE CUTTING FLUID)

4-C'sink and deburr X-Bolt spacer holes, prepare for Welding.

5-Blow all chips from inside tube

6-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting Pick:

Qty ☐ Part Number ☐ Description ☐ Batch
A/R ☐ ☐ Sikaflex-291 ☐ M112429 ☐

Sikaflex expire date: 10/2/30

Start Time: 4:00 Date: 10/5/10

Fin Time: _____ Date: _____

11/05/10

-AWM 10-5-10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DOA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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Work Order ID 57322

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Item ID: D315-668-011

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Revision ID:

Item Name: Skidtube LH

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Start Date: 06/04/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 16/04/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev. Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

160



Skidtubes

Skidtubes

0.00

Memo

0.00

LANDING GEAR RESOURCE 1

1-Weld crossbolt spacers D2909as per Dwg. D2904and QSI 004.
For D2579 spacers, weld one side, pass Y" drill, weld other side, pass Y" drill
A/R□□ Aluminum Rod *m 112507*

BE 10/05/11

2-Grind welds as per Dwg D2909

3-Install remaining rivets arround X-Bolt spacer , use rivet shaver as necessary

M 10/5/12

4-Deburr,inspect tube for any visible scratches

170



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

*8 10/5/12**10*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 57322

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Item Name: Skidtube LH

Start Date: 06/04/2010 Start Qty: 1.00

Required Date: 16/04/2010 Req'd Qty: 1.00

Reference:

Accept



Setup Start

Stop

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

180

QC10- Inspect visual per QSI004- ground welds

0.00

Subst 12

QC

Memo

0.00

Quality Control

190

Pressure Wash per QSI005 4.3

0.00

HandFinish

Memo

0.00

Hand Finishing

① BL-10-5-13.

200

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00

Powdercoat

Memo

0.00

Powder Coating

START TIME: _____
OVEN TEMPERATURE: _____
FINISH TIME: _____

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Work Order ID 57322

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Item ID: D315-668-011

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Accept



Item Name: Skidtube LH

Setup

Start



Start Date: 06/04/2010 Start Qty: 1.00

Stop



Required Date: 16/04/2010 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

210



QC

Quality Control

QC3- Inspect Part Finish

0.00

Memo

0.00

220



HandFinish

Hand Finishing

HandFinishing

0.00

Memo

0.00

HAND FINISHING RESOURCE #1

1-Install inserts & wearplates as per Dwg. D2904. Use a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ ☐ ☐ ☐

Sikaflex expire date: _____

3-Inspect for foreign object per QSI 024

4-Install 2646 Aft & fwd Caps as per Dwg D2904 and seal with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ ☐ ☐ ☐

Sikaflex expire date: _____

5-Wing Walk as per Dwg D2904 and QSI 005

4.4

Batch: _____

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Stop



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Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

230



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

240



Packaging

Packaging

Identify as per dwg & Stock Location:

0.00

Memo

0.00

250



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

MF
10-8-04

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

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Page 1

Work Order ID: 57322

Parent Item: D315-668-011

Parent Item Name: Skidtube LH


Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
D2904B		Manufactured	No			110	Each	2.0000	1.0000			
												
Skidtube, 315												

Warehouse

Location

Main Warehouse

LG

31826

36926

Loc Qty

Loc Code

2

1

1

110

Each

44.0000

2.0000



B57330 D M12/1/14

D2910



Doubler

Manufactured No

Warehouse

Location

Main Warehouse

ST030

36927

Loc Qty

Loc Code

44

44

110

Each

53.0000

2.0000



2 pcs MB 10-04-19

D2911



Doubler

Manufactured No

Warehouse

Location

Main Warehouse

ST030

36928

Loc Qty

Loc Code

53

53

2 pcs

2 pcs MB 10-04-19

2 pcs

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

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Page 2

Work Order ID: 57322

Parent Item: D315-668-011

Parent Item Name: Skidtube LH

Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/	Replacement	Mfg/ Purchased	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
MS27039-1-08			No			110	Each	1,958.000	54.0000			
Screw												

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse	ST291	1958	
	110552	44	
	110835	1914	
D2912	Manufactured	No	
		150	Each
		40.0000	2.0000

Doubler

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse	ST030	40	
	36929	40	
		150	Each
		228.0000	256.0000

MS20601-AD4W3

Purchased

No

Rivet

Warehouse	Location	Loc Qty	Loc Code
Main Warehouse	ST322	228	
	111359	28	
	113899	200	

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Page 2

CR3212-4-03 M114436

264

11/10/5/10

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

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Page 3

Work Order ID: 57322

Parent Item: D315-668-011

Parent Item Name: Skidtube LH


Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2905	Replacement	Mfg/ Manufactured	Bin	Primary	Last	Route	Unit of	Qty on	Remaining	Qty	Date	Status
			No			160	Each	0.0000	1.0000			

Web, 315 Skidtube

ALS4-1032-130

Purchased

No

220

Each

40.0000

50.0000

B57333 ① 4/9/5/10

Insert

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST282

40

110511

40

220

Each

4,693.000

54.0000

AN960JD10L

Purchased

No

Washer

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST348

4693

110985

4693

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Page 3

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 4

Work Order ID: 57322

Parent Item: D315-668-011

Parent Item Name: Skidtube LH





Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2646	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 220	Unit of Each	Qty on 35.0000	Remaining 2.0000	Qty	Date	Status																				
																																
Aft Cap																																
<table><tr><th><u>Warehouse</u></th><th><u>Location</u></th><th><u>Loc Qty</u></th><th><u>Loc Code</u></th></tr><tr><td>Main Warehouse</td><td>FP6</td><td>28</td><td></td></tr><tr><td></td><td>52663</td><td>28</td><td></td></tr><tr><td>Main Warehouse</td><td>fp7</td><td>7</td><td></td></tr><tr><td></td><td>52663</td><td>7</td><td></td></tr></table>													<u>Warehouse</u>	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>	Main Warehouse	FP6	28			52663	28		Main Warehouse	fp7	7			52663	7	
<u>Warehouse</u>	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>																													
Main Warehouse	FP6	28																														
	52663	28																														
Main Warehouse	fp7	7																														
	52663	7																														
D2648-3		Manufactured	No			220	Each	40.0000	5.0000																							
																																
Wearpad																																
<table><tr><th><u>Warehouse</u></th><th><u>Location</u></th><th><u>Loc Qty</u></th><th><u>Loc Code</u></th></tr><tr><td>OFFSHORE</td><td>FG</td><td>12</td><td></td></tr><tr><td></td><td>45316</td><td>12</td><td></td></tr><tr><td>Main Warehouse</td><td>FP17</td><td>28</td><td></td></tr><tr><td></td><td>52516</td><td>28</td><td></td></tr></table>													<u>Warehouse</u>	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>	OFFSHORE	FG	12			45316	12		Main Warehouse	FP17	28			52516	28	
<u>Warehouse</u>	<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>																													
OFFSHORE	FG	12																														
	45316	12																														
Main Warehouse	FP17	28																														
	52516	28																														

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W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Page 5

Work Order ID: 57322

Parent Item: D315-668-011

Parent Item Name: Skidtube LH

Comments: IPP Rev:A New Issue 07-04-12 JLM
 IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
 by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2656-13	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 220	Unit of Each	Qty on 15.0000	Remaining 1.0000	Qty	Date	Status
--------------------------------	-------------	----------------------	-----------	---------	------	--------------	-----------------	-------------------	---------------------	-----	------	--------

Wearplate

Warehouse

Location

Main Warehouse

FP20

12

55454

12

Main Warehouse

MEZZ

3

44158

3

Manufactured No

220

Each

22.0000

1.0000

D2656-33

Wearplate

Warehouse

Location

Main Warehouse

MEZZ

22

43806

9

46167

13

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

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Page 6

Work Order ID: 57322

Parent Item: D315-668-011

Parent Item Name: Skidtube LH





Comments: IPP Rev:A New Issue 07-04-12 JLM
IPP Rev:B remove seq. 19 (handfinish wing walk) 08-04-30 DD verified
by:EC

Start Date: 06/04/2010

Required Date: 16/04/2010

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D2907	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 220	Unit of Each	Qty on 32.0000	Remaining 1.0000	Qty	Date	Status
 Wearshoe												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>FP</div> <div>14654</div> </div> <div> <div>Loc Qty</div> <div>32</div> </div> <div> <div>Loc Code</div> </div>												
D2909		Manufactured	No			220	Each	129.0000	11.0000			
 Spacer, Lama												
<div> <div>Warehouse</div> <div>Location</div> <div>Main Warehouse</div> <div>LG</div> <div>12947</div> <div>14091</div> </div> <div> <div>Loc Qty</div> <div>129</div> <div>13</div> <div>116</div> </div> <div> <div>Loc Code</div> </div>												

29 } BE 10/05/11

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries



DESIGN <i>IP</i>	DRAWN BY <i>IP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D2904	Rev. B SHEET 1 OF 3
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SCALE NTS
A	99.09.09	NEW ISSUE	
B	00.06.21	CHANGED ANGLES FOR HOLES	

PARTS LIST:

Qty -041	Qty -042	Part Number	Description
X		D2904-041	LH SKIDTUBE ASSEMBLY
	X	D2904-042	RH SKIDTUBE ASSEMBLY
2	2	D2646	CAP
4	4	D2648-3	WEARPAD
1	1	D2648-5	WEARPAD
1	1	D2656-13	WEARSHOE
1	1	D2656-33	WEARSHOE
1		D2904-1	SKIDTUBE
	1	D2904-2	SKIDTUBE
1	1	D2905	WEB
1	1	D2907	WEARSHOE
11	11	D2909	CROSS BOLT SPACER
2	2	D2910	SKIDTUBE DOUBLER
2	2	D2911	SKIDTUBE DOUBLER
2	2	D2912	SKIDTUBE DOUBLER
50	50	ALS7-1032-130 or AKS4-1032-130 or ALS4-1032-130 or ALS7-1032-130	INSERT
54	54	AN960JD10L	WASHER
256	256	MS20601AD4W3	RIVET
54	54	MS27039-1-08	SCREW

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ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK-ORDER
NO. 57322

10-4-05

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE USA, INC. BELLEVUE, WA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D2904	Rev. B
DATE 00.06.21		TITLE SA 315B SKIDTUBE ASSEMBLY	SHEET 2 OF 3
			SCALE 1:20

GENERAL NOTES:

- wlo 57327*
1. TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
 2. MAKE D2904-1 AND D2904-2 FROM D2914 EXTRUSION (INITIAL LENGTH = 142.0).
 3. DAMAGE TOLERANCE ON BENDING:
THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 7 INCHES ABOVE THE GROUND. NO GOUGING IS ACCEPTABLE IN THE FLAT PORTION OF THE TUBE. GOUGES UP TO 0.020 ARE ACCEPTABLE IN THE BENT PORTION OF THE TUBE. TUBE O.D. SHOULD BE 3.150 ± 0.010 IN THE FLAT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.
 4. ALL HOLES DRILLED ON CENTERLINES EXCEPT THOSE NOTED BY SECTION C-C.
 5. DRILL #30 HOLES ($\varnothing 0.128$ REF) TO LINE UP WITH $\varnothing 0.128$ HOLES IN D2910/D2911/D2912 DOUBLERS. C'SINK $\varnothing 0.239 \times 100^\circ$.
 6. BOND D2905 WEB INTO D2904-1 (OR D2904-2) OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241/291 ADHESIVE PER DART QSI 015. ENSURE HOLES LINE-UP.
 7. WELDING TO BE DONE PER DART QSI 004.
 8. AFTER DRILLING, BENDING, AND INSTALLING WEB & DOUBLERS, PERFORM THE FOLLOWING FOR $\varnothing 0.500$ HOLES ONLY:
 - CHAMFER HOLE $0.050 \times 45^\circ$.
 - INSERT D2909 SPACER (11 PLACES)
 - WELD INTO PLACE
 - GRIND FLUSH
 - DRILL OUT SPACER TO $\varnothing 0.406$
 9. FINAL CONFIGURATION SHOULD HAVE THE FOLLOWING MINIMUM MECHANICAL PROPERTIES:
 - MINIMUM YIELD TENSILE STRENGTH = 35 ksi
 - MINIMUM ULTIMATE TENSILE STRENGTH = 38 ksi
 10. FINISH:
 - ACID ETCH, ALODINE ASSEMBLY PER DART QSI 005 4.1 PRIOR TO INSTALLING D2905 WEB AND D2910/D2911/D2912 DOUBLERS.
 - POWDER COAT WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3
 - BLACK ANTI-SKID PAINT AS INDICATED TO 1.0 ABOVE SKIDTUBE CENTER-LINE PER DART 005 4.4 (OPTIONAL).
 11. DRILL $\varnothing 0.297$ FOR ALS7-1032-130 INSERT USING DT8395 BEFORE FINISH. INSTALL ALS7-1032-130 INSERTS AFTER FINISH.

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00.09.01 *[Signature]*

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

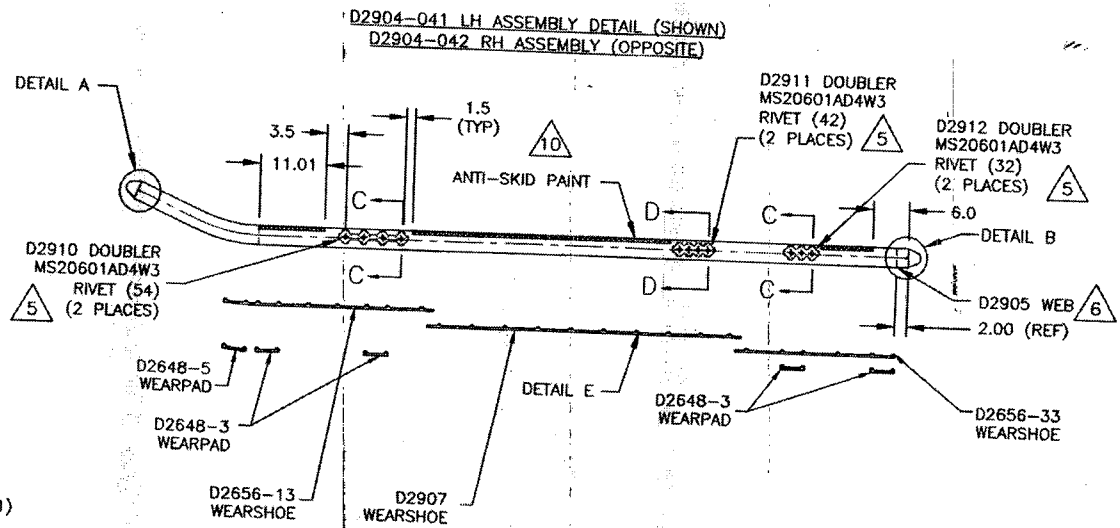
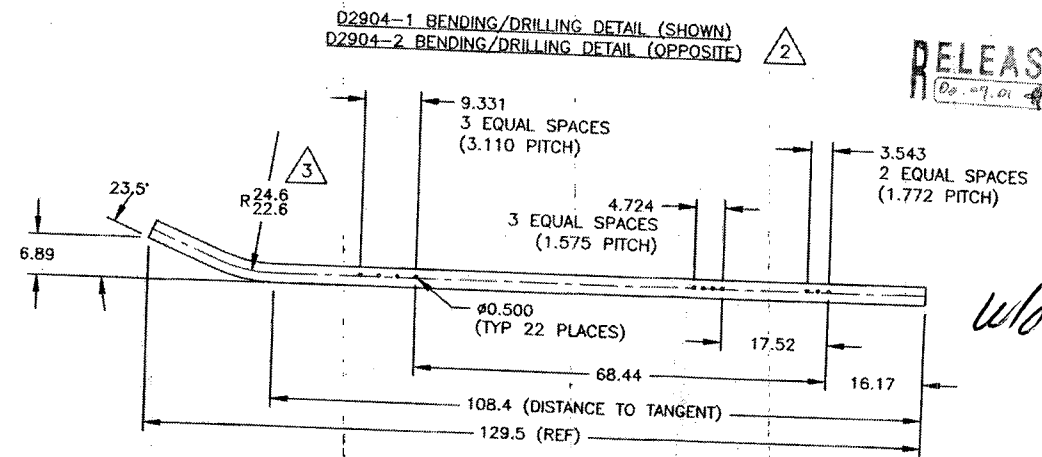
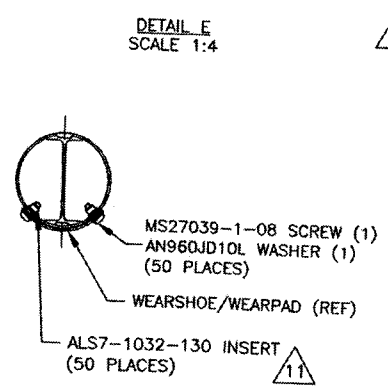
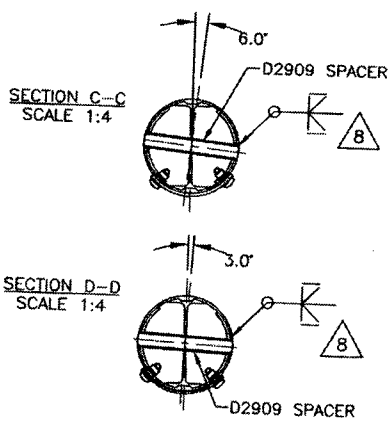
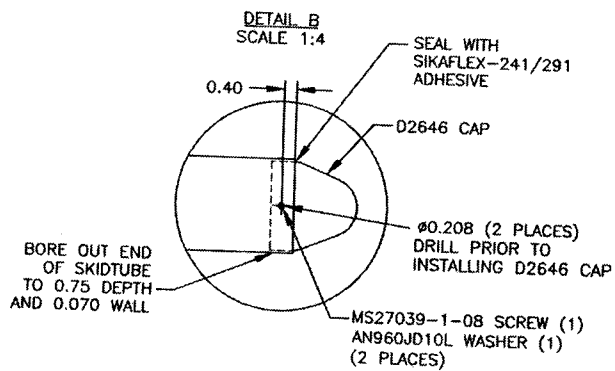
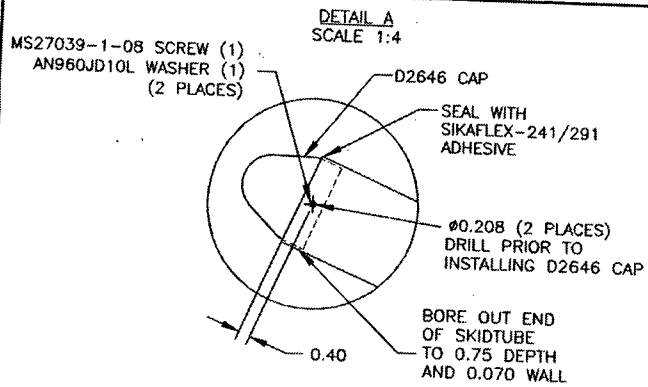
Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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DATE 00.06.21		REV. B SHEET 3 OF 3		
TITLE SA 315B SKIDTUBE ASSEMBLY		SCALE 1:20		

W1057322

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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			Initial Chief Eng	Action Description Chief Eng			

NOTE: Date & initial all entries

NO. 152

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Eliot
Job number: B36894
Part number: A315668011
Description: Skid tube (Lamin)
Welding Process: Tig[☒] Mig[]
Base material: Aluminum
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier David David Date of Test Coupon 08/04/24

Welder Barclay Eliot Date of Test Coupon 08/04/24

The above named individual is qualified in accordance with AWS D17.1.2001 to weld